Subject:	**DEVELOPING AND IMPLEMENTING STANDARDIZED PILOT PROCEDURES FOR AIRPORT SURFACE OPERATIONS**	Date: x/x/xx		AC No:	**91-XX**
		Initiated by:	**AFS-200**	Change:	

1. PURPOSE. This advisory circular (AC) provides guidelines for the development and implementation of standard pilot procedures for conducting safe aircraft operations on the airport surface. It is intended for use by Title 14 of the Code of Federal Regulations (14 CFR) parts 121 and 135 certificate holders as well as part 91 small and large aircraft operators. These guidelines should become an integral part of all standard operating procedures, flight operations manuals, and formal training programs. Standard use of developed procedures should be emphasized during the training of all pilots seeking certification and during the training of all pilots operating under parts 121 and 135. The use of standard procedures for operating on the airport surface should further be emphasized during the Flight Review (refer to 14 CFR part 61, section 61.56) of all certificated pilots.

2. FOCUS. This guidance focuses on the activities occurring within the cockpit (e.g. planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g. steering, maneuvering). Although there are many similarities, taxi operations for single piloted aircraft, as opposed to aircraft that require more than one pilot, present distinct challenges and requirements. These distinct challenges are elaborated, when necessary, throughout the guidance. An additional section deals with operations at airports without operating control towers. Finally, a section is devoted to the use of exterior aircraft lights in making an aircraft more conspicuous to other pilots.

3. RELATED READING MATERIAL

    a. Aeronautical Information Manual (AIM)

    b. AC 90-42, Traffic Advisory Practices at Airports Without Operating Control Towers

    c. AC 90-66, Recommended Standard Traffic Patterns and Practices for Aeronautical Operations at Airports Without Operating Control Towers

    d. AC 120-57A, Surface Movement Guidance and Control System

    e. Operations At Towered Airports, AOPA Air Safety Foundation

    f. Operations At Nontowered Airports, AOPA Air Safety Foundation

4. BACKGROUND. In the past, the process of getting to and from the runway was relatively simple compared to other phases of flight, and little attention was given to formalizing pilot procedures for airport surface operations. As a result, a variety of pilot procedures evolved primarily based on what pilots have observed others doing or what just seemed right at the time.

    a. Recently, many airports have expanded or experienced an increase in traffic, which has resulted in an increased complexity of runway and taxiway layouts and fast paced air traffic control (ATC) operations. In general, airport surface operations have become more difficult and potentially more hazardous than in past years. To increase safety and efficiency, it is necessary to lessen the exposure to hazards and risks by holding pilot workload to a minimum during surface movements. This can be accomplished through procedures that allow pilots to be prepared to devote their attention to only essential tasks while the aircraft is in motion. This requires the development and formalized teaching of safe operating procedures.

    b. In developing procedures, it is important to consider existing pilot workload prior to take off and before landing. Considerations should be given to some of the tasks that make up the normal workload of all pilots, such as accomplishing checklists, setting navigational aids, configuring the aircraft for takeoff and landing, and managing communications with Air Traffic Control. Pilots of many large aircraft have additional tasks such as programming Flight Management Systems and data link messaging. In addition, pilots for large commercial operators are also tasked with voice or data link communications with their company. The more complex the activities within the cockpit work environment, the greater is the need for formal and standardized procedures. The overall goal is for air carriers and pilots to develop formal standardized pilot procedures that will increase the pilot's awareness but will not increase the pilot's workload while the aircraft is in motion on the surface of the airport.

5. PILOT PROCEDURES

    a. General. The potential for runway incursions can be reduced through adequate planning, coordination, and communication. The following guidelines are intended to help pilots cope more effectively with current airport conditions during airport surface operations. All flight crewmembers, regardless of whether they are the pilot in command (PIC), second in command (SIC), flight engineer (FE), or flying a single pilot aircraft, will benefit from this guidance.

        (1) When conducting airport surface operations, a pilot who is operating an aircraft that requires one pilot faces different challenges than pilots operating an aircraft that requires more than one pilot. The guidance points out these differences when necessary.

        (2) The guidelines are grouped into six major categories: Situational Awareness, Planning, Use of Written Taxi Instructions, Intra-cockpit Verbal Coordination, ATC/Pilot Communication, and Taxiing.

    b. Situational Awareness.

        (1) When conducting airport surface operations, you should always be aware of your situation; in other words, you should always know what is going on around you. You should

know your aircraft's precise location on the movement area. Sometimes, this is a challenge, especially when you are at an unfamiliar airport, the airport layout and taxi routes are complex, or the visibility is poor. It is important for you to follow ATC instructions and clearances, to have and use an airport diagram, and to use the visual aids available at the airport, such as the signs, markings, and lighting, when taxiing on the airport.

(2) Regardless of what means you use to taxi on the airport, the objective is to establish and maintain situation awareness – to see and know the location of the aircraft on the airport surface at a particular moment. You should use a "continuous loop" process for actively monitoring and updating your progress and location during taxi. This includes knowing the aircraft's present location and mentally calculating the next location on the route that will require increased attention. For example, a turn onto another taxiway, an intersecting runway, or any other transition point. For aircraft that require more than one pilot, as the "continuous loop" is updated, you should verbally share relevant information with other crewmembers.

(a) Situational awareness is enhanced by monitoring ATC instructions/clearances issued to other aircraft.

(b) Prior to entering or crossing any runway, scan the full length of the runway, including approach areas. In aircraft that require more than one pilot, verbally confirm scan results with other crewmembers in the cockpit and have them do the same.

(c) Be especially vigilant when instructed to taxi into position and hold, particularly at night or during periods of reduced visibility. Do not remain in position and hold on the departure runway for an extended period without direct communication from ATC. If you are uncertain about your status, query ATC. If you suspect radio problems, observe the tower for light gun signals.

(d) Use extra caution when directed to use a runway as a taxiway, especially during reduced visibility.

(e) Landing on a runway where the exit taxiway will shortly intersect another runway must be approached with the utmost caution. All crewmembers must have a common understanding of ATC's expectations regarding where the aircraft is to stop and must be able to identify the holding points. Immediately advise ATC if there is any uncertainty that you will be able to comply with their instructions.

> **CAUTION: When holding short of a parallel runway or close in taxiway after landing, be certain that the aircraft is actually clear of the landing runway. If uncertain, advise ATC.**

(f) After landing and exiting the runway, nonessential communications and nonessential flightcrew actions should not be initiated until clear (on the inbound side) of all runways.

   c. Planning. Thorough planning for taxi operations is essential for a safe operation. You should give as much attention to the planning of the airport surface movement portion of the flight as you give to the planning of other phases of the flight. Make planning for airport surface operations an integral part of your flight planning process. Your planning should be done in two main phases. First, you should anticipate airport surface movements by doing pre-taxi or prelanding planning based on information on the ATIS and on previous experience at that airport. Second, once taxi instructions are received, the prelanding or pre-taxi plans should be reviewed and updated as necessary. If you are operating a plane that requires more than one pilot, make sure the updated plan is understood by all crewmembers.

   (1) Pre-taxing planning and briefing. For aircraft that require more than one pilot, the following guidance should be used to conduct a briefing of all flight crewmembers. For a single pilot aircraft, the pilot should be sure to adequately review this information.

   (a) How familiar are you (and your crew) with the airport? Have you flown out of or into the airport recently? Might there have been changes made at the airport since your last flight? Remember to review the latest Notices to Airmen (NOTAM) for both your departure and arrival airports for information concerning construction and/or taxiway/runway closures.

   (b) Take a few minutes and study the airport layout. If you have a flightcrew, make sure airport diagrams are readily available to all crewmembers. Check your expected taxi route against the diagram or taxi chart. Pay special attention to any tricky or complex intersections along the route. While planning for departure, be sure to consider the likely inbound taxi route at your arrival airport as well. If you have a flight crew, make sure you identify critical times or locations on the taxi route (transitioning through complex intersections, crossing intervening runways, entering and lining up on the runway for takeoff, and approaching and lining up on the runway for landing) where verbal coordination between the PIC and the SIC will be necessary to ensure correct aircraft navigation and crew orientation.

   (c) For aircraft that require more than one pilot, you should plan the timing and execution of cockpit checklists and company communications that may take place during taxi so the SIC can be available to participate in verbal coordination with the PIC to confirm compliance with ATC taxi instructions at the appropriate times or locations. When planning these tasks, you should also consider the anticipated duration of taxi, locations of complex intersections, runway crossings, and visibility along the taxi route. If at all possible, during low visibility operations you should only conduct pre-departure checklists when the aircraft is stopped.

   (2) After taxi instructions are received from ATC. All pilots should use these guidelines. In aircraft that require more than one pilot, good communication between flight crewmembers is essential.

   (a) When ATC gives you taxi instructions, it is a good idea to write them down. This reduces your vulnerability to forgetting or misunderstanding your taxi instructions. They do not always have to be copied down verbatim. (Individual pilots may choose to develop a set of symbols and shorthand notations which allow them to clearly record and later recall key items in the taxi instructions.) It may only be necessary to record the basic elements of the taxi clearance;

however, where the taxi instructions are complex or you are unfamiliar with the airport layout, a verbatim transcription of all instructions is desirable. At many airports, taxi instructions can be very complex, involving numerous turns and transitions, as well as runway crossing and hold short instructions. During these airport surface operations, pilots are very busy with a variety of cockpit duties that compete for their attention. Misunderstanding or forgetting any part of the taxi instructions can lead to an unsafe situation. Writing down the instructions helps alleviate these problems.

(b) If you have any doubt that you correctly copied and understood your taxi route, ask ATC for clarification.

(c) Once you write down the instructions, they can be used as follows:

1. As a reference for reading back the instructions to ATC.

2. For crewmember coordination on the assigned runway and taxi route.

3. For a short pre-taxi or prelanding briefing on the pending airport surface operation.

4. As a means of reconfirming the taxi route and any restrictions at any time during the airport surface operation without the need to call ATC for a repeat or clarification.

NOTE: While written taxi instructions are a good operating technique, common sense and flexibility should be used in determining the crew's need for them at a specific airport. For example, if the departure runway is very near the parking location, or if the crew has used the same taxi route numerous times in the previous days, it may only be necessary to record the basic elements of the taxi clearance. Also, you may wish to develop a set of symbols and shorthand notations that will allow you to clearly record and later recall key items of the taxi instructions.

(d) When you have the ATC-issued taxi route, you should compare it to your planned taxi route and update your plan as necessary. In aircraft that require more than one pilot, you need to make sure that all crewmembers review and understand the updated taxi plan.

CAUTION: A potential pitfall of pre-taxi and prelanding planning is setting expectations and then receiving different instructions from ATC. Ensure that you are following the clearance you actually received, and not the one you expected to receive.

   d. Intra-cockpit Verbal Coordination. For aircraft that require more than one pilot, it is essential that the PIC, SIC, and, if applicable, the Flight Engineer (FE) all correctly understand and agree on all ATC ground movement instructions. Any misunderstanding or disagreement should be resolved to the satisfaction of all crewmembers before taxiing the aircraft. It is the verbal aspect of this coordination that is most significant. It is not enough to assume that all crewmembers have heard and understood instructions correctly. A common understanding can

be enhanced by one crewmember repeating the instructions verbally and getting agreement on the content and intent from the other crewmember(s). When crewmembers verbally confirm their understanding of the instructions, they then have a chance to discover and correct any misunderstandings before they become incidents. This verbal coordination/agreement should include:

(1) When ATC issues taxi instructions for a departure, the PIC and SIC should refer to the airport diagram, coordinate verbally, and agree on the assigned runway and taxi route, including any instructions to hold short of or cross an intersecting runway.

(2) When ATC issues landing instructions, the PIC and SIC should coordinate verbally and agree on the runway assigned by ATC, as well as any restrictions, such as holding short of an intersecting runway.

(3) After landing and exiting the runway, the PIC and SIC should coordinate verbally and agree on the ATC taxi instructions to the parking area, including any instructions to hold short of or cross an intersecting runway.

(4) At complex intersections, flight crewmembers should verbally coordinate to be sure that the intersection is correctly identified and that the aircraft is transitioning through the intersection to the correct taxiway.

(5) When approaching an intersecting runway, flight crewmembers should verbally coordinate in order to identify the runway. They should also verbally review the ATC instructions as to whether they are to hold short of or cross the runway.

(6) Before crossing any runway or entering a runway for takeoff, both pilots should visually scan to the left and to the right, including the full length of the runway and its approach paths, and coordinate verbally that the scan area is or is not clear.

(7) Before entering a runway for takeoff, flight crewmembers should verbally coordinate to ensure correct identification of the runway and receipt of the proper ATC clearance to use it. Similar verification should be performed during approach to landing.

(8) When it becomes necessary for a crewmember to stop monitoring the ATC frequency, he or she should tell the other crewmembers, both when stopping the monitoring, and when starting again. Any instructions or information received or transmitted during that crewmember's absence from the ATC frequency should be briefed and reviewed upon his or her return.

(9) When the pilot not taxiing the aircraft is required to go "heads down," such as when entering information into the Flight Management System, and is not able to visually monitor the aircraft's progress, he or she should verbally notify the pilot taxiing. Likewise, "heads up" or "back live" should be announced when that crewmember has completed his or her task and is again able to visually monitor the taxi operation.

   e. ATC/Pilot Communication. The primary way you as a pilot and ATC communicate is by voice. The safety and efficiency of surface operations at airports with airport traffic control towers depend on this "communication loop." Controllers use standard phraseology and require readbacks and other responses from you in order to ensure that you clearly understand clearances and instructions. In order to complete the "communication loop," the controllers must also clearly understand your readbacks and other responses. You can help enhance controllers' understanding by responding appropriately, using standard phraseology. 14 CFR, AIM, and training and organizational manuals provide information for pilots on standard ATC phraseology and communications requirements. Some of the most important guidelines that contribute to clear and accurate communications are repeated here.

        (1) Maintain a "sterile" cockpit. Pilots must be able to focus on their duties without being distracted by non-flight related matters, such as eating meals, engaging in non-essential conversation, or reading material not related to the safe and proper operation of the cockpit. In smaller planes, you may need to ask your passengers to refrain from unnecessary conversation from the time you begin your pre-flight preparations until you are clear of the terminal area and at cruising altitude. The same procedure should be followed on arrival, from the time you begin landing preparations until you are safely stopped at your destination.

        (2) Use standard ATC phraseology at all times in order to facilitate clear and concise ATC/pilot communications.

        (3) Focus on what ATC is saying. Do not perform any non-essential tasks while communicating with ATC.

        (4) Readback all hold short and runway crossing instructions, including the runway designator.

        (5) Readback all clearances to takeoff and land, including the runway designator.

        (6) Clarify any misunderstanding or confusion concerning ATC instructions or clearances to the satisfaction of all crewmembers.

   f. Taxiing. This paragraph will not discuss speed management, steering, or maneuvering the aircraft, but will suggest some good practices regarding other cockpit activities.

        (1) Prior to taxiing, all pilots and crewmembers should have a copy of the airport diagram.

            (a) If you are operating a single-pilot aircraft, follow the aircraft's progress on the airport diagram to ensure that you are following the instructions received from ATC.

            (b) For aircraft that require more than one pilot, a crewmember other than the pilot taxiing the aircraft should follow the aircraft's progress on the airport diagram to ensure that the instructions received from ATC are being followed.

(2) The aircraft compass or heading display is an excellent tool, as a supplement to visual orientation, for confirming correct taxiway or runway alignment. Refer to it as frequently as necessary, but especially at complex intersections and where the takeoff ends of two runways are in close proximity to one another.

(3) Low visibility conditions increase the challenge of safely moving the aircraft on the airport surface. Although visibility is technically designated as "low" when the RVR falls below 1200 feet, visibility along the taxi route may be considerably less than the runway visibility. Use all resources available, including additional crewmembers, heading indicators, airport signs, markings and lighting, and airport diagrams to the fullest extent possible in order to keep the aircraft on its assigned route.

(4) Anytime you become uncertain about your location on the movement area, stop the aircraft and immediately advise ATC. If necessary, request progressive taxi instructions.

> **Caution. Do not stop on a runway. If possible, taxi off the runway and then initiate communications with ATC to regain your orientation.**

(5) When cleared to takeoff, or to cross a runway, or when exiting a runway, do so in a timely manner. Inform ATC of any anticipated delay.

(6) After landing, **do not** exit onto another runway without prior ATC authorization.

   g. Summary. Safely taxiing an aircraft, especially at some of the more complex airports, can pose a challenge, even to the most experienced pilots. However, adherence to the guidelines presented in this circular can enhance the safety of the operation. Some pilots may find it useful to develop an airport surface movement checklist as a quick reference for these guidelines. An example of such a checklist follows this section.

6. AIRPORT SURFACE MOVEMENT CHECKLIST.

   a. Before Taxi.

(1) **Plan and, if applicable, brief airport surface operations** with as much attention as is given to planning other phases of flight.

(2) Check the NOTAMs.

(3) Have an **airport diagram** readily available for yourself and for each crewmember, if applicable.

(4) Use the **airport diagram** to plan and understand the taxi route.

(5) **Write taxi instructions** down when received.

(6) Ensure that **all crewmembers** agree on what is expected. If you do not understand the taxi instructions, or if you cannot come to a consensus among flight crewmembers, seek clarification from ATC.

b. Taxi for Departure

(1) Use the **airport diagram** to monitor progress on the taxi route.

(2) Utilize the **compass or heading display** to confirm correct taxiway alignment.

(3) **First things first.** Do not allow other cockpit duties and non-ATC communications to divert your attention from the safe movement of the aircraft, especially at critical times, such as runway crossings and transitioning through complex taxiway intersections.

(4) If **uncertain as to your location** on the airport, **stop** the aircraft and immediately **advise ATC**. If necessary, request progressive taxi instructions. **Caution. Do not stop on a runway. If possible, taxi off the runway and then initiate communications with ATC to regain your orientation.**

(5) **Monitor ATC** communications with other aircraft.

(6) Use **standard phraseology** and **readback** all runway crossing and hold short instructions, and clearances to take off or land.

(7) Prior to entering or crossing any runway, ask yourself, am I certain that I am cleared to enter this runway? If you are not absolutely certain that you are cleared, do not enter the runway. Stop and ask ATC for clarification.

(8) Prior to entering onto any runway, **scan** the full length of the runway, including approach areas.

(9) **If you have other crewmembers, verbally coordinate** all runway crossing clearances, hold short instructions and other critical items to ensure a common understanding.

(10) Be **especially vigilant** during periods of **reduced visibility** when **taxiing on or crossing any runway**.

c. Taking the Runway.

(1) **Readback** all clearances to takeoff or to position and hold, including the runway designator.

(2) Prior to entering onto the runway, **scan** the full length of the runway, including approach areas.

(3) Prior to entering onto the runway, if you have other flight crewmembers, **verbally confirm** among them that you are cleared to enter the runway and that the runway and approach area are clear of other aircraft.

(4) Utilize the **compass or heading display** to confirm correct runway alignment.

(5) Be **especially vigilant** when instructed to **taxi into position and hold**, particularly at night or during periods of reduced visibility.

(6) **Do not remain in position and hold** on the departure runway for an extended period without direct communication with ATC. If you suspect radio problems, observe the tower for light gun signals.

(7) **Use exterior lights** to enhance your plane's visibility.

   d. Prior to Initial Descent.

   (1) Plan and, if applicable, brief airport surface operations with as much attention as is given to planning other phases of flight.

(2) Have an **airport diagram** readily available for yourself and, if applicable, for each crewmember.

(3) Use the **airport diagram** to plan the expected taxi route.

   e. Exiting the Runway

(1) When ATC issues landing instructions, you should pay particular attention to the assigned runway as well as any restrictions, such as holding short of an intersecting runway; if there is more than one pilot, the crew should **coordinate verbally** and agree on the **runway assigned** by ATC, as well as **any restrictions**, such as holding short of an intersecting runway.

(2) Clear the runway in a timely manner. Inform ATC of any anticipated delay.

(3) After landing and exiting the runway, nonessential communications and nonessential flightcrew actions should not be initiated until clear (on the inbound side) of all runways.

(4) For aircraft that require more than one pilot: after landing and exiting the runway, the crew should **coordinate verbally** and agree on the **ATC taxi instructions** to the parking area, including any instructions to hold short of or cross an intersecting runway.

(5) For single-pilot aircraft: after landing and exiting the runway, mentally review ATC taxi instructions, including any instructions to hold short of or cross an intersecting runway. If uncertain about any part of your taxi clearance, ask ATC for clarification.

   f. Taxi In.

(1) **Write taxi instructions** down when received.

(2) If you are a single pilot, ensure that you understand what ATC expects you to do. If you do not fully understand, seek clarification from ATC.

(3) For aircraft that require more than one pilot, ensure that **all crewmembers** agree on what is expected. If you cannot agree, seek clarification from ATC.

(3) Use the **airport diagram** to monitor progress on the taxi route.

(4) Utilize the **compass or heading display** to confirm correct taxiway alignment.

(5) **First things first.** Do not allow other cockpit duties and non-ATC communications to divert your attention from the safe movement of the aircraft, especially at critical times, such as runway crossings and transitioning through complex taxiway intersections.

(6) If **uncertain as to your location** on the airport, **stop** the aircraft and immediately **advise ATC.** If necessary, request progressive taxi instructions. **Caution. Do not stop on a runway. If possible, taxi off the runway and then initiate communications with ATC to regain your orientation.**

(7) **Monitor ATC** communications with other aircraft.

(8) Use **standard phraseology** and **readback** all runway crossing and hold short instructions.

(9) Prior to entering onto any runway, **scan** the full length of the runway, including approach areas.

(10) Prior to entering or crossing any runway, ask yourself, am I certain that I am cleared to enter this runway? If you are not absolutely certain that you are cleared, do not enter the runway. Stop and ask ATC for clarification.

(11) **Verbally coordinate** all runway crossing clearances, hold short instructions and other critical items to ensure a common understanding.

(12) Be **especially vigilant** during periods of **reduced visibility** when **taxiing on or crossing any runway**.

7. AIRPORT SURFACE OPERATIONS AT AIRPORTS WITHOUT AN OPERATING CONTROL TOWER

  a. General. The absence of an operating airport traffic control tower creates a need for increased vigilance on the part of pilots operating at those airports. There are also specific communications procedures that differ from those used at towered airports. As is the case at

towered airports, planning, clear communications and enhanced situational awareness during airport surface operations will reduce the potential for surface incidents at airports without an operating control tower. This section will focus on those aspects of airport surface operations that are unique to airports without an operating control tower and will not repeat in detail information covered in other sections of this AC. Follow the guidance in the rest of this AC, but when operating at an airport without an operating control tower, also consider the following:

  b. Situational awareness. While maintaining situational awareness is important in all circumstances, it is particularly important when operating at an airport without an operating control tower. To achieve situational awareness, you should be fully aware of your intended taxi route and be able to follow the planned route correctly. Without ATC to verbally tell you where you should taxi and where and when to stop, you must rely on visual cues to maintain situational awareness and maintain your planned taxi route. These visual cues include airport signs, markings, and lighting, together with the airport diagram. These particular cues are especially useful during periods of poor visibility. As you become familiar with an airport that you use frequently, you may rely more on other visual cues, such as the locations and bearings of taxiways and runways to the terminal, other buildings, hangars, the ramp areas, and other physical features. In poor visibility these distant cues may not be visible, and you must revert to using signs, markings, and lighting. Other things to consider that can help you maintain situational awareness while operating at an airport without a working control tower:

    (1) Monitor the appropriate frequency. Listen to what other aircraft on the frequency are saying.

    (2) If possible, monitor the approach control frequency to alert you to IFR traffic inbound to the airport.

    (3) Prior to entering or crossing any runway, scan the full length of the runway, including approach areas. **Do not** engage in any other cockpit duties while crossing a runway. Give your full attention to crossing and clearing the runway.

    (4) Use exterior lighting to make your aircraft more conspicuous to other pilots. Use of exterior lighting is discussed further in paragraph 9 of this circular.

    (5) Landing on a runway where the exit taxiway will shortly intersect another runway must be approached with the utmost caution.

  c. Planning. As when operating at an airport with an operating tower, thorough planning for taxi operations is essential for a safe operation. The airport surface movement portion of the flight should be planned with as much attention as is given to planning other phases of flight. Make planning for airport surface operations an integral part of your flight planning process. Along with the guidance in paragraph 5, the following should be considered when operating at an airport without an operating control tower:

    Caution. Some airports have part-time control towers. When planning to fly into or out of such an airport, be absolutely certain of the tower's status

before conducting any operations. If in doubt, attempt contact on the tower's frequency.

(1) Take a few minutes and study the airport layout. Use an airport diagram to plan your taxi. Pay special attention to any tricky or complex intersections along the route. While planning for departure, be sure to consider the likely inbound taxi route at your arrival airport as well.

(2) Familiarize yourself with the local traffic pattern. Remember, not all airports use a standard traffic pattern. Don't forget to check the pattern altitude.

Caution. During calm or nearly calm wind conditions, be aware that pilots may have a choice of what runway to land on or take off from, and that other pilots' choices may conflict with you own choice. Also, aircraft may be utilizing an instrument approach procedure to runways other than the runway in use for VFR operations. The instrument approach runway may intersect the VFR runway.

(3) Familiarize yourself with the local common traffic advisory frequency (CTAF) or Unicom frequency.

(4) If there is more than one crewmember, brief your taxi plans and be sure that all crewmembers have a common understanding of the plan.

d. Communication. Communication rules and guidelines for operations at airports without an operating control tower differ from those applicable at towered airports. 14 CFR, Aeronautical Information Manual (AIM), and training and organizational procedures manuals provide information for pilots on standard phraseology and communication requirements. Some of the most important guidelines for radio communications at airports without an operating control tower include:

(1) Ensure that your radio is tuned to the appropriate CTAF or Unicom frequency. Monitor the CTAF frequency for a few minutes before beginning taxi to help you "get the picture."

(2) Ensure that the frequency is available by listening before transmitting.

(3) Transmit your intentions clearly, but be as brief as possible.

(4) Always state the name of the airport at which you are operating at the beginning and end of your transmission.

(5) Use your full call sign whenever there is another aircraft on the frequency with a similar call sign.

Caution. Some aircraft operating at airports without operating control towers may not be equipped with a radio. You must remain alert for them.

Note. If your aircraft does not have a radio, consider the benefits of obtaining and using a handheld radio.

e. **Taxiing.** This paragraph will not discuss speed management, steering or maneuvering the aircraft, but will suggest some good practices regarding other cockpit activities.

(1) Prior to taxiing, have a copy of the airport diagram available (one for each crewmember in a multi-piloted aircraft) and during taxi, follow the aircraft's progress on the airport diagram to ensure that it conforms to your planned route.

(2) The compass or heading display is an excellent tool for confirming correct taxiway or runway alignment. Refer to it as frequently as necessary, but especially at complex intersections and where the takeoff ends of two runways are in close proximity to one another.

(3) Low visibility conditions increase the challenge of safely moving the aircraft on the airport surface. Use all resources available, including additional crewmembers, heading indicators, airport signs, markings and lighting, and airport diagrams to the fullest extent possible in order to keep the aircraft on your planned route.

(4) Anytime you become uncertain about your location on the movement area, stop the aircraft and do not resume taxi until you have regained your orientation.

Caution. Do not stop on a runway. If possible, taxi off the runway and then reorient yourself.

(5) When taking off from, crossing, or exiting a runway, do so in a timely manner. When departing, complete all preparations prior to taking the runway.

(6) If there is more than one pilot in the cockpit, prior to entering a runway, both pilots should visually scan to the left and right, including the full length of the runway and approach areas, and verbally state either "clear" or "not clear".

f. **Summary.** Safe airport surface operations at airports without operating control towers pose unique challenges. However, adherence to the guidelines presented here can enhance the safety of the operation.

8. SURFACE MOVEMENT CHECKLIST FOR AIRPORTS WITHOUT AN OPERATING CONTROL TOWER This checklist supplements the Checklist in paragraph 6, Airport Surface Movement Checklist. Use this checklist along with the one in paragraph 6 when operating at an airport without an operating control tower.

a. **Before Taxi.**

(1) Check the operating hours and status of the control tower, if applicable.

(2) Monitor the CTAF or Unicom frequency.

b. Taxi for Departure.

(1) Monitor the CTAF or Unicom frequency.

(2) If possible, monitor approach control.

c. Taking the Runway.

(1) Announce your intentions.

(2) Do not line up on the runway and hold any longer than necessary.

9. USE OF EXTERIOR AIRCRAFT LIGHTS TO MAKE AIRCRAFT MORE CONSPICUOUS

a. General.

(1) Exterior aircraft lights may be used to make an aircraft operating on the airport surface more conspicuous. Pilots may use various combinations of exterior lights to convey their location and intent to other pilots. Certain exterior lights may also be used in various combinations to signal whether the aircraft is on a taxiway or on a runway, in position on the runway but holding for takeoff clearance, crossing an active runway, or moving down the runway for takeoff.

(2) As adherence to the guidelines contained in this AC is voluntary, and aircraft equipment varies, pilots are cautioned not to rely solely on the status of an aircraft's lights to determine the other pilot's intentions. Additionally, pilots must be familiar with, and respect any operating limitations on their aircraft's lighting systems.

b. Exterior Lights. To the extent possible, consistent with aircraft equipage and aircraft system operating limitations, illuminate exterior lights as follows:

(1) Engine running. Turn on the **rotating beacon** whenever an engine is running.

(2) Taxiing. Prior to commencing taxi turn on **navigation, position, anti-collision, and logo lights**. Strobe lights should not be illuminated during taxi if they will adversely affect the vision of other pilots or ground personnel.

(3) Crossing a runway. **All exterior lights** should be illuminated when crossing a runway.

(4) Entering a runway to takeoff. When entering a runway to takeoff, or when taxiing into position and holding for takeoff, illuminate **one or more landing lights and all other exterior lights**. Strobe lights should not be illuminated if they will adversely affect the vision of other pilots or ground personnel.

(5) Takeoff. Turn on **all remaining landing lights** when takeoff clearance is received, or when commencing takeoff roll at an airport without an operating control tower.

L. Nicholas Lacey
Director, Flight Standards Service